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SPECIFICATION FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

(First Reprint NOVEMBER 1979)

UDC 631.877.355

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

~~Price Rs 5·00~~ Gr 2

July 1965

Indian Standard

SPECIFICATION FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

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Indian Standard

SPECIFICATION FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 4 December 1964, after the draft finalized by the Acids and Fertilizers Sectional Committee had been approved by the Chemical Division Council.

0.2 In the preparation of this standard, assistance has been derived from the data furnished by the manufacturers of oilcake in the country and other technical institutions. Reference has also been made to Bulletin No. 174 (1933) 'Composition of important manures' issued by the Department of Agriculture, Bombay.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 - 1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of test for castorseed cake for use as fertilizer. The oilcake obtained by all the processes, including solvent extraction, is covered in this standard.

2. TERMINOLOGY

2.1 For the purpose of this standard, the following definitions shall apply.

2.1.1 *Decorticated Castorseed Cake* — The material obtained by pressing or extracting castorseed after it has been well hulled or shelled.

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*Rules for rounding off numerical values (*revised*).

2.1.2 *Undecorticated Castorseed Cake* — The material obtained by pressing or extracting oil from clean castorseed without removing the outer covering.

3. TYPES

3.1 The material shall be of two types, namely:

a) *Type* 1 — Decorticated, and
b) *Type* 2 — Undecorticated.

4. REQUIREMENTS

4.1 **Description** — The material shall be uniform in texture, clean and free from adulterants, such as sand, dust and metallic pieces.

4.2 The material shall pass wholly through 2·36-mm IS Sieve of which not less than 70 percent shall pass through 850-micron IS Sieve (*see* IS : 460-1962*).

4.3 The material shall also comply with the requirements given in Table 1 when tested according to the methods prescribed in IS : 1714-1960† and Appendix A. Reference to relevant clauses of IS : 1714-1960† is given in col 6 of the table.

TABLE 1 REQUIREMENTS FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

Sl No.	Characteristic	Requirement for		Method of Test, Ref to	
		Type 1	Type 2	Appendix	Cl No. in IS : 1714-1960*
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture, percent by weight, *Max*	8·0	8·0	—	5
ii)	†Water insoluble organic nitrogen, percent by weight, *Min*	4·5	3·5	A	—
iii)	†Total ash, percent by weight, *Max*	9·5	10·0	—	9
iv)	†Acid insoluble ash, percent by weight, *Max*	2·4	2·5	—	10

*Methods of sampling and test for oilcakes as livestock feed.
†On moisture-free basis.

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*Specification for test sieves (*revised*).

†Methods of sampling and test for oilcakes as livestock feed.

5. PACKING AND MARKING

5.1 Packing — The material shall be packed in clean and sound jute bags. The mouth of each bag shall be either machine-stitched or hand-stitched with strong jute twine with at least 14 stitches in each row.

5.2 Marking — Each bag shall be suitably marked indicating clearly that the material is 'for use as fertilizer' and shall also be marked with the following information:

a) Name and type of the material,
b) Name of the manufacturer,
c) Batch number,
d) Net weight, and
e) Date of packing.

5.2.1 The bags may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 Preparation of Test Samples — Representative test samples of the material shall be prepared as prescribed in **2** of IS : 1714-1960*.

6.1.1 *Number of Tests* — Tests for water insoluble organic nitrogen shall be conducted on each of the individual samples. Tests for the other characteristics prescribed in Table 1 shall be conducted on the composite sample.

6.1.2 *Criteria for Conformity* — A lot shall be considered as conforming to this specification if the stipulations laid down in **6.1.2.1** and **6.1.2.2** are fulfilled.

6.1.2.1 Each of the test results for water insoluble organic nitrogen satisfies the requirement specified.

6.1.2.2 The test results on the composite sample satisfy the corresponding requirements specified for the remaining characteristics.

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*Methods of sampling and test for oilcakes as livestock feed.

APPENDIX A

[*Table* 1, *Item* (ii)]

DETERMINATION OF WATER INSOLUBLE ORGANIC NITROGEN

A-1. APPARATUS

A-1.1 Kjeldahl Flask — 500 ml capacity.

A-1.2 Distillation Assembly — The apparatus as assembled is shown in Fig. 1. It consists of a round-bottom flask *A* of 1 000 ml capacity fitted with a rubber stopper through which passes one end of the connecting bulb tube *B*. The other end of the bulb tube is connected to the condenser *C* which is attached by means of a rubber tube to a dip tube *D* which dips into a quantity of standard sulphuric acid contained in beaker *E* of 500 ml capacity, to which 3 to 4 drops of methyl red indicator solution have been added.

A-2. REAGENTS

A-2.1 Potassium Sulphate — (Anhydrous sodium sulphate may be used if potassium sulphate is not available.)

A-2.2 Copper Sulphate

A-2.3 Concentrated Sulphuric Acid — conforming to IS : 266-1961*.

A-2.4 Sodium Hydroxide Solution — Dissolve about 450 g of sodium hydroxide in 1 000 ml of water.

A-2.5 Standard Sulphuric Acid — 0·5 N.

A-2.6 Standard Sodium Hydroxide Solution — 0·25 N.

A-2.7 Methyl Red Indicator Solution — Dissolve one gram of methyl red in 200 ml of rectified spirit (conforming to IS : 323-1959†).

A-3. PROCEDURE

A-3.1 Weigh accurately about 2 to 4 g of the material into a clean beaker. Stir well with water for a few minutes and filter through a filter paper (Whatman No. 2 or equivalent). Transfer the residue completely to the filter paper using a fine jet of water. Carefully put the filter paper containing the residue into a 500-ml Kjeldahl flask. Add about 10 g of potassium sulphate or anhydrous sodium sulphate, about

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*Specification for sulphuric acid (*revised*).

†Specification for rectified spirit (*revised*).

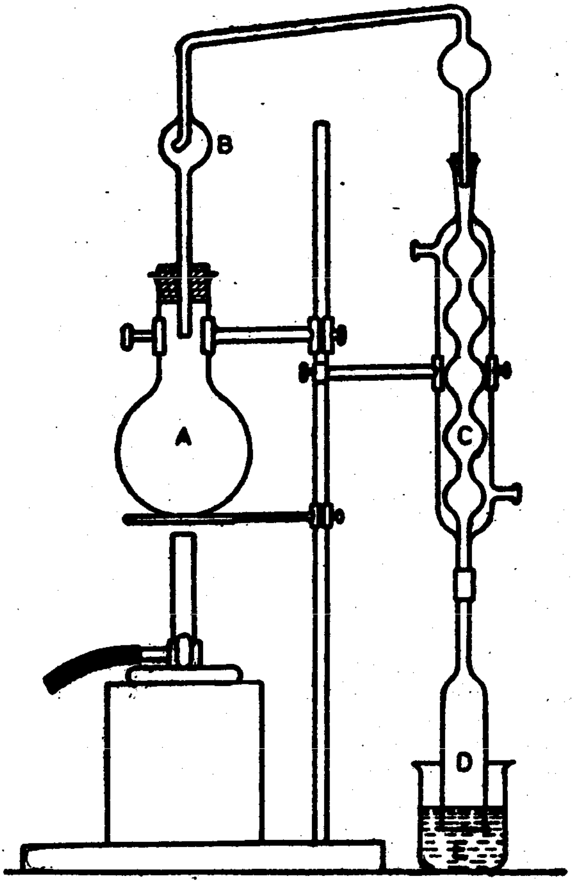

FIG. 1 APPARATUS FOR DETERMINATION OF WATER INSOLUBLE ORGANIC NITROGEN

0·5 g of copper sulphate and 25 ml or more, if necessary, of concentrated sulphuric acid. Place the flask in an inclined position, and heat below the boiling point of the acid until frothing ceases. Increase heat until the acid boils vigorously and digest for a time (about two hours) after the mixture is clear or until the oxidation is complete. Cool the contents of the flask. Transfer quantitatively to the round-bottom flask *A* with water, the total quantity of water used being about 200 ml. Add a few pieces of pumice stone to prevent bumping. Add the sodium hydroxide solution, in a quantity which is sufficient to make the solution alkaline, carefully by the side of the flask so that it does not mix at once with the acid solution but forms a layer below the acid layer. Assemble the apparatus taking care that the tip of the dip tube *D* extends below the surface of the standard sulphuric acid solution in the beaker. Mix the contents of the flask by shaking and distil one-third of total volume of the liquid in flask *A* to ensure complete distillation. Titrate the contents of the beaker *E* with standard sodium hydroxide solution.

A-3.2 Carry out a blank determination using all reagents in the same quantities but without the material to be tested.

A-4. CALCULATION

A-4.1 Water insoluble organic nitrogen, percent by weight (on moisture-free basis) $= \dfrac{140\,(B - A)N}{W\,(100 - M)}$

where

B = volume in ml of the standard sodium hydroxide solution used to neutralize the acid in blank determination (**A-3.2**),

A = volume in ml of the standard sodium hydroxide solution used to neutralize the excess acid in the test with the material,

N = normality of the standard sodium hydroxide solution,

W = weight in g of the material taken for the test, and

M = percentage moisture in the sample.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	2 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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AMENDMENT NO. 1 OCTOBER 1983
TO
IS:3029-1964 SPECIFICATION FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

Corrigendum

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